

# **Development of Replacement Beef Heifers**

## **Introduction to Replacement Heifers:**

The economic importance of beef cows having a live, healthy calf to market every 12 months is obvious and has been emphasized in many publications. Heifer management is the cornerstone of the overall program. This is based on the premise that heifers that are given an opportunity to get off to a good start are more likely to be productive, profitable cows the remainder of their lifetimes. Proper growth and development of replacement heifers will aid in their ability to deliver and raise a healthy first calf and then rebreed for the subsequent calf crop. Two factors must be considered with replacement heifers: 1) they are expensive and (2) the management of first-calf heifers affects their productivity for the remainder of their lifetimes. Inadequate development of replacement females will be paid for eventually, either in terms of a larger feed bill or in terms of an open cow (nature's way of catching up). Lower rebreeding rates for heifers compared to mature cows are normal through the second calf. When the demands on the heifers are studied, reasons for difficult rebreeding become apparent. The heifer up until maturity, at about five years of age, must grow and at the same time lactate and produce a calf. The loss of incisor teeth between the ages of 18 months and four years is an added handicap that reduces their ability to graze. It is difficult for heifers to make up growth during any of the critical first years.

Uniform calf crops are the result of shortened breeding seasons. Shortened breeding seasons for the entire cowherd must start with the replacement heifers. Shortened breeding seasons for the replacement heifers require that the manager/owner of those heifers must think of the heifers as a group as well as individuals. The objective is to have the entire complement of replacements bred closely in time and 3 weeks or more before the adult cows.

## **Heifer Development from Birth to Weaning:**

In most beef cow-calf operations, the early development of the replacement heifers is entrusted entirely to the heifers' mothers. However, some cattle producers use creep feeds to boost calf gains while they are still nursing the cows. Also occasionally some purebred operations raising embryo transfer calves will utilize dairy cows as surrogate mothers and these calves are exposed to large quantities of milk while growing. Even though the cost effectiveness of these practices of these practices are often debated, there is little doubt that they will increase calf gain.

A hidden expense, that may occur in a few instances, comes as a result of increased body condition in young heifer calves while still nursing their mothers. Heifers that become extremely fat from high energy creep feeds or very heavy milking mothers have been shown to have reduced milking ability of their own when mature. Mammary development is in a critical stage from two or three months of age until about nine months, or just before puberty. If a calf is storing considerable amounts of extra fat during that time, excessive fat can be deposited in the mammary gland and inhibit its development. On the other hand, a certain minimum amount of fat is necessary for the gland to grow, so underfeeding can inhibit development as well. Beef producers need to look within their herds and observe heifer body condition if they are using high energy creep feeds or dairy-based recipient cows. Because of the differences in birth weight and frame size it is impossible to recommend a common average daily gain that would be appropriate for all young heifers. Therefore monitoring the body condition (fatness) of the heifer calf through visual appraisal may be the most practical way to evaluate the potential likelihood

of excess fatness. Creep feeding calves with a self-limited amount of high protein feed (such as soybean meal) can allow most heifer calves to grow adequately without concern for extreme fatness. Heifer growing programs that encourage maximum growth without excessive fatness will allow the young heifer to get off to a good start and brings her to the next critical growing segment. Sound research data is now available to recommend that replacement heifers need not be implanted with a growth stimulating implant. Heifers implanted at birth and close to puberty had larger reductions in reproductive performance. In those instances where producers cannot choose which will be replacement heifers at calf-working time, there is a practical solution. Implant those younger, lighter half of the heifers that are very likely to be candidates to sell at weaning time. Leave those heifers that have greatest chance to be replacements UN-implanted. To be totally safe, just don't implant heifers which you know might be a replacement heifer.

Early immunization for blackleg and malignant edema at approximately 2 months of age will be appropriate in most areas for all calves including those that become replacements. If heifers are to be vaccinated for brucellosis, be certain to do this between 4 and 10 months of age. It is advisable to vaccinate heifers nearer the younger age if possible. Other immunizations should be done 3 to 4 weeks prior to weaning. Booster injections can be given at weaning time. Often just one more booster with a modified live vaccine at a year of age will provide lifetime protection against the respiratory diseases. Visit with you local veterinarian and develop a total herd health program that is most appropriate for your herd health history and local disease situation.

Weaning stress can result in serious health problems, especially respiratory disease. Heifers that are affected with respiratory disease and pneumonia often have significant lung damage, do not grow and develop properly, and must be culled prior to breeding.

Approximately 1.5 times as many heifers as will actually be needed for replacements should be selected on the basis that they will be between 13 and 15 months of age at the beginning of the heifer-breeding season. This will allow for some culling based upon lack of adequate growth, small pelvic area or failure to become pregnant during the breeding season.

### **Development from Weaning to Breeding:**

The period between weaning and breeding is a very critical time in the life of a beef female. At weaning she is between 7 and 10 months old and weighs, in general, 350 to 650 pounds. Some six months later, she is exposed to the bull or to artificial insemination. Hopefully, most of these heifers are bred in the first 21 days and 80 percent or more are pregnant after a 45 day breeding season. Growing programs for weaned replacement heifers must be adequate to allow enough gain from weaning to 13 months of age to allow a high percentage of heifers to begin cycling. Since most beef breed replacements will need to gain 240 pounds between weaning and breeding, the heifers must gain at least 1.33 pounds per day.

It should be emphasized that replacement heifers need to be fed separately from the rest of the herd. Because of their size and age, as well as higher nutritional demands, they simply cannot compete with the rest of the cow herd, nor can they be expected to efficiently utilize poorer quality forages and still breed as yearlings.

If there are wide ranges between the smaller and larger heifers, they should be divided into two feeding groups to reach their desired weight by breeding time. The days between initial weighing and beginning of the breeding season are then calculated. The average daily gain necessary to reach the desired breeding weight is determined, and the heifers are fed to attain that average daily gain. The addition of approved levels of ionophores such as monensin

(Rumensin; Elanco) or lasalocid (Bovatec; HoffmanLaRoche) to the ration will improve the average daily gain and enhance onset of puberty.

Onset of puberty is affected by age, weight, breed, and adverse environmental stresses such as temperature and parasitism. Of these factors, weight is the one that most producers can readily influence. Researchers and producers have observed that high percentages of heifers will not reach puberty until they have reached a minimum weight. These weights usually represent about 65% of the potential mature size. Therefore, the first target weight to consider is that at the beginning of the breeding season. If the heifers weigh about 55% of the mature size producers can expect only 50% of them to be cycling at the beginning of the breeding season. However, about 90% of most beef breed heifers will be cycling when they weight 65% of their mature weight. Many producers have not recently weighed the adult cows in their herd to know what average mature weight to expect. Therefore most commercial producers would underestimate the mature size and underestimate the target weights for the heifers. Recent data from the American Angus Association (with records of over 20,000 cows) indicates that average mature size in the seedstock portion of their bred is about 1,200 pounds. Heifers from 1,200 pound mothers will need to weigh about 780 pounds by the start of the first breeding season. If the mature size of the herd is 1,100 pounds then the heifers can be about 715 pounds when breeding begins. And only heifers with potential mature size of 1,000 pounds can be expected to cycle at 650 pounds. These weights will not be exact since there is considerable variation within breeds, but the data show that large cattle must be fed for greater growth rates than smaller cattle.

<b>Breed</b>	<b>Weight (lbs) at Breeding 50% Cycling</b>	<b>Weight (lbs) at Breeding 90% Cycling</b>	<b>Anticipated Mature Weight (lbs)</b>
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Average Puberty Age 13-16 months

Angus	660	780	1200
Brangus	650	765	1175
Charolais	715	845	1300
Hereford	660	780	1200
Shorthorn	560	780	1200
British X British	690	815	1250
Charolais X British	690	815	1250
Jersey X British	550	650	1000
Limousin X British	650	775	1190
Simmental X British	690	815	1250

Average Puberty Age 16-20 months

Brahman	700	750	1150
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Santa Gert.	700	750	1150
Brahman X British	675	750	1150

Individual rather than group weights need to be considered when developing replacements. Simply because a group of heifers has reached a desired average weight at 15 months of age does not mean that all will reach puberty. If the group averages 700 lbs, some probably will weigh 600 and others 800. Those that weigh 600 will not breed well, while those weighing 800 have been fed more than was required. Replacement heifers should be sorted by size and fed to reach the desired weight, thereby giving the most feed to the heifers that need it.

Age is also an important factor, especially in Brahman cattle. Many of these heifers will not reach puberty until they are 16 to 20 months of age. The same rule of thumb concerning 65% of the mature weight still applies for Brahman cattle, but the additional days of age also are important. **Using Ionophores in Replacement Heifer Diets** In an effort to insure more replacement heifers are bred to calve early in their first calving season, producers should consider using a supplement containing an ionophore in the growing diet of the heifers. "Ionophore" is the generalized name for the feed additives monensin (Rumensin) and lasalocid (Bovatec). Both are presently approved for use with growing programs for replacement heifers. Research conducted in Texas and Wyoming indicated that growing heifers fed 200 mg monensin per head per day reached puberty at an earlier age than did similar heifers fed similar diets containing no monensin. Similar data is available for lasalocid. Most stocker cattle research has indicated that the addition of 100-200 mg of an ionophore will increase average daily gain by .1 to .2 pound per day. Over a 150 day growing period of a replacement heifer, this means an additional 15-30 pounds in average weight improvement of the heifers by breeding time.

**Summary of Replacement Development:**

The most economical growing program for replacement heifers is going to utilize standing or harvested forages as a major portion of the diet. Heifers may be grown slowly then given higher energy feed to accelerate the rate of gain to achieve the required 65% of mature size by the start of the breeding season.

Utilize the highest quality hays and/or the best pastures because young cattle cannot utilize low quality roughage as well as the mature cows.

Use an ionophore to improve feed utilization and hasten the onset of puberty.

– This information was adapted from Glenn Selk, Extension Cattle Reproduction Specialist, Oklahoma State University